

Popular Dual-Lever Keyer Paddles — Part 2

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This is the second part of a review of popular dual-lever keyer paddles. The first part appeared in May 2010 *QST*.³ This month we'll look at two heavy keys of classic design and two low volume keys from newer companies. Three of the keys are ready to operate out of the box. The other is a rather challenging kit.

All four of these paddles have flat bases with projections beneath and no machined channel for the keyer cable, so their rubber feet cannot be removed and replaced by a semi-permanent mounting system. The dislodging force figures in Table 3 are therefore especially important for evaluating them. All four paddles in this review perform better when placed on a high friction pad.

Special thanks to Margaret Prior, K7MWP, and Stan Schmidt, N7OC, for their considerable help in preparing for this review.

VIBROPLEX IAMBIC STANDARD

My wife Margaret, K7MWP, gave me the Vibroplex Iambic Deluxe as a wedding present, so it is a sentimental favorite. Vibroplex produces four different dual-lever paddle models in the Iambic series. Their working mechanisms are almost identical, differing mostly in aesthetics. The Iambic Standard (reviewed here) has a textured black powder coated, cold rolled steel base, and its needle bearings are non-jeweled. The Iambic Deluxe has a chrome base and jeweled bearings. The Iambic Presentation adds a gold plated brass plate on its chrome base. The Iambic Gold sports a brushed 24 karat gold plated base.



Do the non jeweled bearings of the Iambic Standard make a difference? I cannot tell any difference between the new Iambic Standard action used for this review and that of my 20 year old Iambic Deluxe paddle. Twenty years from now may tell a different story. The jew-

³B. Prior, N7RR, "Popular Dual-Lever Keyer Paddles," Product Review, *QST*, May 2010, pp 49-52.

eled bearings will probably stand up better in the long term.

The design of the Iambic paddles bears a close resemblance to the Vibroplex Original Bug. The pivots are mounted close to the front, so a relatively small motion applied to the fingerpieces controls rather long levers with the compression springs about midway and the contacts toward the back. That arrangement of moving a fair amount of mass with each stroke gives the Vibroplex Iambic a bug-like swinging feel if adjusted with moderate tension and wide spaces between its silver contacts. Each stroke produces a characteristic vibration, typical of heavy long levered paddles. Using three feet rather than four gives the Iambic series paddles excellent stability on any operating surface, just as with Vibroplex bugs.

The customer supplied electrical cord requires no soldering. Cable wires are attached to three finger-screw posts at the very rear on the top of the paddle. The fingerpieces are mounted quite high (1.4 to 2.3 inches above the operating surface), almost identical to the thumbpiece height of the Vibroplex bug in my collection. That's probably too high for long term ergonomic comfort for some operators, especially those who are finger squeezers rather than wrist rotating slappers.

Years ago, it was said that Vibroplex Iambic paddles are best suited for operators with long semiautomatic bug experience who wish to make the transition to iambic electronic keying. That's because they can be adjusted to produce a feel very similar to a bug, with rather strong return tension and wide contact spacing. The big surprise, however, is that this paddle can be adjusted very quickly down to extremely light return force and close spacing. Left and right paddle spring tension and contact space adjustments are accomplished easily with readily accessible finger screws and lock nuts. Tension can be adjusted down to such a light setting that the lever will close when the paddle is turned 90° sideways. Contact spacing can be adjusted to extremely close stable gaps.

No wonder the Vibroplex Iambic series has achieved the status of a classic.

Manufacturer: The Vibroplex Company, 2906 Tazewell Pike, Suite A2B, Knoxville, TN 37918; tel 800-840-8873; www.vibroplex.com.

ELECRAFT SPECIAL EDITION HEXKEY

The Elecraft HexKey is identical to the Bencher Hex Iambic Paddle (www.bencher.com) with the addition of the Elecraft brand label and special serial numbers beginning with E. The HexKey is a heavy paddle firmly in the tradition of the N2DAN Mercury and Bencher



Mercury reviewed in March 2009 *QST*.⁴

The HexKey uses attracting magnetic returning gold plated silver contacts, a stylish hexagonal black powder coated leaded steel base and lengthy, heavy levers made of chrome plated brass. Those levers produce the same sort of vibration with each stroke characteristic of both Mercury paddles. Three rubber feet grip nicely to the operating surface. The feet look similar to those on the Vibroplex Iambic paddles, but their rubber is softer. Although the HexKey doesn't slide, the high profile and soft rubber feet impart a slight twisting motion to the paddle while keying. That's not the case with the Vibroplex Iambic paddles and their harder rubber feet. From Table 3 it is evident, however, that the softer HexKey feet stick to the operating surface better than the harder feet do.

The HexKey is a solidly designed paddle. An example of special attention to detail is the provision of separate grounding braid attached to each lever to prevent transient keying. The keying is quite smooth, thanks to miniature precision ball bearing races for movement.

A soldered cable must be installed by the customer to three terminals beneath the paddle. For an extra \$10.95, Bencher offers a universal hookup kit, which includes a 4 foot cable, ¼ inch and ½ inch stereo plugs plus pre-soldered push-on terminals. A strain relief bracket is already included beneath the paddle base, so an installed cable should be trouble free for years.

⁴B. Prior, N7RR, "High End Dual-Lever Keyer Paddles," Product Review, *QST*, Mar 2009, pp 49-52.

Bottom Line

This concludes our overview of popular dual-lever paddles. Whether you prefer a light or heavy touch, one of these paddles reviewed this month or last month is sure to find a place in your station.

Table 3
Summary — Popular Dual-Lever Paddles — Part 2

Model	Return, Bearings and Base	Hardware and Contacts	Dislodging Pressure*	Levers and Fingerpieces	Weight (lb)	Price (plus s/h)
Vibroplex Iambic Standard	Compression spring; return; jeweled needle pivots; black powder-coated steel base	Chrome-plated brass hardware; silver contacts	7 oz/ 14.4 oz	Chrome plated brass levers; black plastic fingerpieces 35 to 59 mm high	2.8	\$160
Elecraft HexKey	Attracting magnet return; precision ball bearing races; black powder-coated steel base	Chrome-plated brass hardware; gold-plated silver contacts	12.3 oz/ 15.5 oz	Chrome plated brass levers; dark translucent acrylic fingerpieces 19 to 55 mm high	3.2	\$200
K8RA P-2	Two adjustable compression springs; four miniature precision ball bearings; lacquered brass base	Brass hardware; silver contacts	10.9 oz/ 14.4 oz	Long brass levers; wood fingerpieces 18 to 61 mm high (acrylic fingerpieces also included)	2.7	\$120
W5JH Black Widow Kit	Single return compression spring plus two attracting magnets; four ball bearings; brass base	Brass hardware; silver plated screw contacts	5.3 oz/ 7.7 oz	Medium length brass levers; thin plastic fingerpieces 5 to 40 mm high	1.4	\$58

*Lateral finger pressure required to move the paddle on a laminate surface (first figure) and with a friction mat. See text.

When the Elecraft HexKey paddle arrived, it had clearly been well packaged and there was no sign of damage in shipment. Nevertheless, one of the stanchions that secures one of the two contact assemblies was detached from the paddle. Attempts to reattach the stanchion failed because the 1 inch machine screw used to secure it is very slightly too short. We contacted Elecraft and Bencher about the problem. It turns out that some minor recent component changes introduced a slight size increase. I was able to saw down a locally available substitute 1¼ inch machine screw to 1⅙ inches, which fixed the problem. Elecraft and Bencher are now alert to the situation, and they will happily send longer screws to any customer who experiences a similar problem.

Adjustments can be made independently to the left and right paddle contact distance and magnetic return force on the HexKey. The adjustments must be locked into place by tightening hex screws. A matching hex wrench is included with the paddle. The wrench is attached to the underside with a fahnestock clip so it's readily available when needed. Getting those adjustments just right can be impractical during a busy operating session, so HexKey users should take the time to adjust the paddle properly before operating it on the air. Once locked in place, the adjustments are very stable.

Return tension for left or right levers is accomplished by changing the gap between two strong magnets. The tension on the high end can be very strong, indeed. On the low end, it cannot be made as light as the spring tension on the Vibroplex Iambic paddles.

Operators who prefer very light touch action will want to look for paddles with levers that are shorter and lighter than the ones on

the HexKey. Those who would like the feel of the classic N2DAN or Bencher Mercury paddles at a reasonable sticker price should seriously consider the HexKey.

Manufacturer: Elecraft, PO Box 69, Aptos, CA 95001; tel 831-662-8345; www.elecraft.com.

K8RA P-2

The K8RA P-2 paddle came with paduk wood fingerpieces mounted, plus two extra clear acrylic fingerpieces and a hex driver for securing both the fingerpieces and the setscrews. This aesthetically pleasing gem is equipped with four miniature precision sealed ball bearings, rendering its action exceptionally smooth. Since the levers are made of brass rather than some lighter alternative, a fair amount of mass must be moved with each stroke. The difference is probably most noticeable if using relatively wide lever spacing.

Each P-2 paddle is crafted individually by Jerry Pittenger, K8RA. An experienced builder with an eye for detail, his multiband HF amplifier appears on the cover of the 2006 *ARRL Handbook*.



The best comparison product for the K8RA P-2 is the Scheunemann Der Morse Dirigent, which was reviewed in Part 1. Both are precision instruments with a lacquered finish that shows off their beautiful brass to fine effect.

The measured dislodging force for the P-2 is slightly less than for the HexKey. K8RA sells other similar paddles that weigh more, so they are more likely to stay in place when operated by an energetic fist. Since each is hand-crafted, Jerry is willing to shape fingerpieces according to a customer's specifications to achieve different heights above the operating surface. That kind of personal attention is a significant advantage of dealing with a low volume manufacturer such as K8RA.

Adjustment of spring tension and contact spacing is a straightforward process, but locking the adjustments in place does require the use of the nice handled hex wrench included with each paddle. Borrowing an idea from the HexKey, a user could attach a matching right angle hex wrench to the bottom of the P-2 using a Fahnestock clip, since the long hex wrench supplied with the paddle might go astray over time.

Spring tension can be quite strong on the high end, and on the low end it cannot be adjusted to be as light as the Vibroplex Iambic series. The springs are the weakest part of the K8RA design, since they are rather long and could easily become dislodged in a busy operating environment, launching themselves into space. On the other hand, the springs are quite accessible and could easily be replaced by stronger or weaker ones if desired.

The precision action of the P-2 makes it a fine choice for operators who prefer close contact spacing and (perhaps with weaker substitute springs) very light tension for high

speed iambic keying. The beauty of the P-2 is stunning.

Manufacturer: Jerry Pittenger, K8RA, 6930 Cook Rd, Powell, OH 43065; www.k8ra.com.

W5JH BLACK WIDOW PADDLE KIT

The W5JH Black Widow is the most economical paddle in this review, but by no means the lowest in quality. Its low cost is possible since it is not a finished product, but rather a kit with lots for the builder to do.

The kit includes a manual on a CD-ROM with text in Microsoft Word format, including integrated illustrations. The inventory list is not keyed to individual items in the one page components picture.

Tools needed for assembly include a drill bit for deburring, two grades of sandpaper,



In The May/June 2010 Issue:

■ David Bern, W2LNX, describes his effort to learn how to program a PIC microcontroller to create a useful project. The result is "A PS/2 Keyer: Using a Keyer Paddle to Emulate a PS/2 Keyboard and Mouse." Replace the keyboard and mouse with a keyer paddle to control your computer, or take a paddle, NUE-PSK modem and radio on your next outing for even more portability. David's program is available on the Downloadable Files section of the QEX Web site (www.arrl.org/qexfiles/).

■ Rubens Ramos Fernandes, ex-PY2QE, shows his "Frequency Counter for the Experimenter." This handy piece of test equipment uses a PIC 16F876A microcontroller and the prescaler in a National Semiconductor LMX 2326 RF synthesizer to create a frequency counter that covers 30 Hz to 55 MHz in one range and 55 MHz to 2.8 GHz in the second range.

■ Byron Blanchard, N1KEV, explains the process of "Adjusting Bipolar Junction Transistor Crystal Oscillator Amplitude" output in his

an ohmmeter, soldering equipment, thread, needle nose pliers, screwdriver, epoxy, a vise, a spray can of lacquer, metal polish and cotton gloves. I decided to not lacquer the review paddle, so the lacquer, metal polish and cotton gloves were not used.

The thread has an interesting use: it's to keep the central lever tension spring from launching itself into some inaccessible corner of the ham shack during installation. I left the thread tied to the spring permanently to serve the same function during normal operation. The spring is tied with an overhand knot, and the two thread ends are poked through two holes in the base that are designed to accommodate two silver ground wires. The thread ends are then joined on the bottom of the paddle base with a surgeon's knot. A better long term solution would be to replace two zinc plated 1/4 inch 4-40 magnetic attracting screws on the levers with 3/8 inch screws which would then extend through two sides of the spring, inhibiting its loss.

The hardest labor is sanding the brass components, especially the heavy base, whose scratched surface needed many strokes. In the end, without a power sander I had to be satisfied with a less than optimal finish.

I wasn't impressed by the paddle's action when I first finished it. Then I took it apart a bit to bevel the seat holes for the four steel balls that constitute the paddle bearings. The difference was impressive. I was amazed that such an economical paddle operated so smoothly.

article. With a series of graphs and dc measurements, N1KEV shows us how to set the output amplitude of a basic oscillator circuit, and then explains why this technique works.

■ Mark Spencer, WA8SME, uses small 433 MHz transceiver modules to demonstrate remote telemetry techniques in The ARRL Education and Technology Program. These modules have no squelch function, which limits their usefulness for a data link. Mark added a squelch function as a way of "Solving Random Noise Issues n TRM-433-LT Data."

■ Gary Steinbaugh, AF8L, presents "An Inexpensive Laboratory-Quality RF Wattmeter." This calorimetric design uses a thermistor temperature sensor inside an oil-filled dummy load, and foam insulation to isolate the system from outside temperature fluctuations. Because the system is not frequency sensitive, it can be calibrated using low frequency ac or even dc power sources.


■ Jon Wallace and Richard Flagg, AH6NM, bring us another "Amateur Radio Astronomy Project." This time we learn how to listen for "Radio Signals from Jupiter." You may have already heard these signals around 18 to 28 MHz. There is even computer software to help you display the signals and share them in real time with other amateur astronomers on the Internet.

■ Dr. Sam Green, W0PCE, solves the problem of taking photos of an oscilloscope display with "An Oscilloscope Camera Mount."

The tension return system is most unusual. The W5JH Black Widow combines two forms of return force. The basic form is that single compression spring seated between the two levers which I disciplined with a thread. The spring is not adjustable, so it constitutes the minimum return force. Additional force is produced by left and right adjustable attracting magnets. Return force can be made extremely strong when the magnets are adjusted very close to the attracting screw heads on the levers. For minimum return force, the magnets can be removed.

All adjustments use the red knurled finger-screws, and are very easy to perform with little fuss. Equipped with the supplied nonadjustable spring, the minimum return force is slightly limited. For a lighter touch, the lowest threshold can be decreased by shortening the spring. Contact spacing is stable down to very close distances. The thin white fingerpieces each attached to the lever with a single screw, so their height can be changed by the operator.

The W5JH Black Widow Paddle Kit makes a dandy project for an amateur with an inclination for do-it-yourself work. The reward is the satisfaction of operating a quality paddle with a good portion of sweat equity built in. A properly finished Black Widow is worth far more than the cost of the kit.

Manufacturer: Jerry Haigwood, W5JH, 11402 N 98th Dr, Sun City, AZ 85351; www.w5jh.net. 

His camera mount ensures that the camera lens is centered in front of the oscilloscope screen and properly aligned for the best pictures. Using digital photo editing software, he is able to convert the images into negative format and create gray scale images that are ideal for publication.

■ Bob Kopski, K3NHI, presents a short "Tech Notes" item about the characterization of Analog Devices 8307 logarithmic amplifier ICs. Bob's "Simple RF Power Calibrator" circuit (Jan/Feb 2004 QEX) used this amplifier, and was easily calibrated using a 10 MHz square wave signal. Recent performance changes in these ICs requires a revised circuit and calibration method, which Bob describes in this Note.

■ Ray Mack, W5IFS, is back with another installment of his software defined radio column. In this installment of "SDR: Simplified," Ray describes the steps required to set up a Linux computer to run the Analog Devices Blackfin BF537 DSP IC and Stamp evaluation board software. We are getting close to running some actual DSP experiments on the Blackfin board.

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